



Short communication

Horned lark damage to pre-emerged canola seedlings

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ABSTRACT

Winter canola (*Brassica napus* L.) is considered the most promising domestically-produced oilseed feedstock for biodiesel production and for diversifying wheat (*Triticum aestivum* L.)-based cropping systems in the Inland Pacific Northwest, USA. Winter canola field experiments conducted in east-central Washington were completely destroyed, and commercial fields were damaged or destroyed, over several years by large flocks of horned larks (*Eremophila alpestris* L.) that ate the cotyledon leaves of pre-emerged and newly-emerged seedlings. Numerous control methods were attempted in field experiments, including laying bird netting over the entire experiment, placement of a life-size predator decoy in a field experiment, loud propane-powered cannon blasts, and mixing garlic with canola seed before planting followed by spraying garlic water on the soil surface. None of the attempted control methods were successful. This is the first report in the literature of horned lark damage to pre-emerged and newly-emerged canola seedlings. We discuss questions relevant to our novel account as well as potential abatement using falcons and non-toxic chemical repellents for the protection of industrial canola crops associated with horned lark depredation.

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1. Introduction

Canola is planted on approximately 700,000 ha annually in the United States with about 80% of production in North Dakota (USDA-NASS, 2015). An average of 15,000 ha of canola is planted annually in Washington State (USDA-NASS, 2015). Canola is grown on more than 8 million ha per year in Canada, predominantly in Saskatchewan and Alberta (Government of Canada, 2015). Canola is considered an excellent biodiesel feedstock.

The Washington State Legislature passed a law (RCW 19.112.110) in 2006 that requires at least two percent of diesel sold within the state must be biodiesel. This law further mandates that at least five percent must be biodiesel when the state's Department of Agriculture determines that in-state production of oilseed feedstock can satisfy this requirement. Since 2007, the Legislature has provided annual funding averaging US\$ 300,000 to Washington State University (WSU) for research on production of oilseed feedstocks.

Biodiesel feedstock production research at WSU has largely centered on winter canola (Fig. 1) due to high seed yields compared to spring canola, camelina (*Camelina sativa* L.), and safflower

(*Carthamus tinctorious* L.). Inclusion of canola in wheat-based rotations affords an excellent opportunity for control of grass weeds and soil-borne diseases and enhances nitrogen mineralization that boosts grain yield of the subsequent wheat crop (Kirkegaard et al., 1994; Seymour et al., 2012).

An oilseed crushing plant with a capacity of 1100 mt of canola seed per day was opened in Warden, WA in 2013. This crushing facility provides a local market and reduces transportation costs for canola farmers in eastern Washington. The majority of canola feedstock for the Warden crushing facility is currently imported from Canada and North Dakota.

Horned larks (Fig. 2) are native to North America and they occupy the Arctic south to Mexico. They are also found in central Asia, with outlying populations in Morocco and Columbia. The horned lark is a common bird that prefers short, sparsely vegetated prairies, deserts and agricultural lands (Beason, 1995). Horned larks are permanent residents throughout most of their breeding range (i.e., Canada, U.S. and Mexico), migrating only from northern regions during winter.

In agricultural areas, horned larks inhabit open areas and fallow fields. Horned larks eat mostly seeds during winter. During the breeding season, adults predominantly eat seeds but feed insects to their young. Adults consume more insects during the spring and fall, perhaps to compensate for the energy demands of breeding and molting (i.e., annual feather replacement; Beason, 1995).

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